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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

July 21, 2017

Thomas Wohlford, Interim Closure Manager
Homestake Mining Company of California
P.O. Box 98
Grants, NM 87020

RE: Homestake Mining Company of California (HMC), Condition 21, Discharge Permit 200 (DP-200), Response to *San Andres Glorieta Well 943 (B-28-S-329), Draft Monitoring Well and Pump Test Work Plan* and *Potential Sources to San Andres Glorieta Aquifer Well 943 (B-28-S-329), Condition 4*

Dear Mr. Wohlford:

On May 4, 2017, the New Mexico Environment Department, Mining Environmental Compliance Section (MECS), along with the Nuclear Regulatory Agency (NRC), the US Environmental Protection Agency (EPA), and NM Office of the State Engineer (OSE) (collectively "the Agencies") met with HMC to discuss the results of HMC's well evaluations required pursuant to Condition 21 of DP-200. Condition 21 of DP-200 requires a workplan and an implementation schedule to evaluate the integrity of all HMC wells completed within the San Andres-Glorieta aquifer (SAG). The objective of this study was to determine if cross-contamination from overlying aquifers into the SAG is occurring through any existing HMC wells completed within the SAG.

During the meeting on May 4, 2017, HMC proposed that Well 943 be plugged and abandoned due to well casing integrity concerns, likely resulting in increasing concentrations of contaminants, including uranium and selenium within the SAG. Presently, ground water quality standards are exceeded in Well 943 under Section 20.6.2.3103.A NMAC for selenium and uranium and standards under Section 20.6.2.3103.B NMAC for sulfate and total dissolved solids.

In a letter to HMC dated May 10, 2017, NMED requested HMC cease the use of Well 943, submit a 'work plan' to install a monitoring well adjacent to Well 943 (943M), submit a 'pump test work plan' for Well 943, and explain potential sources and pathways of contamination detected in Well 943. On May 23, 2017 and June 2, 2017, NMED received the above referenced work plans in response to the May 10, 2017 NMED letter and has the following comments. The text in italics is from the NMED May 10, 2017 letter to HMC.

1. *The Agencies request that HMC cease use of Well 943 as a water source, effective immediately.*

   HMC did not indicate that it had ceased the use of Well 943. Please provide confirmation of the cessation of use of Well 943 within 30 days from the date of this letter.

2. *HMC shall install a monitoring well in the immediate area of Well 943 and into the SAG to properly evaluate ground water quality. Within 30 days from the date of this letter, a 'Work Plan' shall be submitted, for approval, to NMED and OSE concurrently describing the well location, well construction, and the drilling method and materials to be used. Monitoring well construction shall be performed in accordance with NMED, March 2011, "Monitoring well construction and abandonment guidelines (rev. 1.1)" (attached) and the regulations in 19.27.4 NMAC that have been issued by the New Mexico Office of the State Engineer, unless an alternative method is approved. In addition, the Work Plan shall include a proposal for water quality sampling, including collection of water quality samples immediately following well development and stabilization.*

   NMED approves the 'Well 943M Work Plan' subject to the following comments. Please respond within 30 days from the date of this letter.

   a. **Well 943M is proposed to be installed 100 feet west of Well 943. NMED requests that the well be placed 200 feet northwest of Well 943. This will ensure that the prior use of Well 943 does not influence Well 943M.**
   b. **An Artesian Well Plan of Operation work plan shall be submitted to OSE as Well 943M will be drilled into artesian conditions. Please submit a revised Artesian Well Plan of Operation (NMAC 19.27.4.31) to OSE and NMED for review.**
   ~~c.~~ **Fiberglass casing is not approved by NMED. Carbon steel casing is approved as this material was previously installed in existing SAG wells within the HMC reclamation project and eliminates any adsorbing and leaching issues (desorption/dissolution) of inorganic and organic constituents within the fiberglass casing. Steel casing also alleviates any concerns of heat generating during the cementing of the annulus as stated in work plan. The steel casing shall be installed from the land surface to the proposed total depth with a slotted well screen and sand filter pack. All requirements shall be incorporated into the revised Artesian Well Plan of Operation mentioned above.**

d. Air rotary or sonic drilling is preferred method to assist in detecting the alluvial and Chinle aquifers.

e. Annular seal around the outside of the casing shall be grouted with 100% cement from the bottom to the land surface. No bentonite shall be added to the casing annular seal.

f. All water generated during the drilling and development of Well 943M shall be contained on site (not discharged to the ground surface) and properly disposed of. Please identify the method used to dispose of water from the drilling and development of Well 943M.

g. Field water quality parameters monitored during the development of Well 943M are appropriate. Water quality samples collected after well stability shall be as follows: calcium, magnesium, sodium, potassium, bicarbonate, fluoride, phosphate, total dissolved solids, selenium, uranium^{234}, uranium^{235}, uranium^{238}, molybdenum, sulfate, chloride, thorium^{230}, radium^{226} and radium^{228}, ammonium, total kjeldahl nitrogen, and nitrate and nitrite-nitrogen.

h. The use of pressure transducer/dataloggers to monitoring water levels is appropriate and approved by NMED. NMED request that the pressure transducer/dataloggers be installed immediately after development of Well 943M to begin collection of water level data.

i. NMED agrees that Well 943M should be added to the quarterly samples routine for HMC and analyzed for the constituents of concern as listed in Item 'g' listed above.

A report documenting well details, including volumes of materials used, composition of materials, drilling method, and aquifers (alluvial and/or Chinle) encountered, shall be submitted to NMED within 30 days of well completion. [20.6.2.3107 NMAC]

Information to be submitted within 30 days of well completion.

3. *Upon completion of the monitoring well installation and sampling as required in Condition 2 listed above, HMC shall conduct a pump test to evaluate hydrologic connectivity between adjacent Chinle or Alluvial wells, as well as hydrologic influence with adjacent SAG wells. Within 60 days from the date of this letter, a 'Pump Test Work Plan' shall be submitted for approval to NMED and OSE concurrently describing the methods and materials to be used for the pump test.*

NMED approves the 'Well 943 Pump Test Work Plan' subject to the following comments. Please respond within 30 days from the date of this letter.

a. Please submit a revised Figure 1 showing the location of all wells to be monitored during the pump test. All wells within the immediate area of the pump test shall be clearly identified with well identifications and symbols to facilitate NMED review (11" x 17").

b. Water from the pump test shall be transported to the reverse osmosis and/or zeolite water treatment system for treatment. As stated in the May 10, 2017 letter and listed above, Item no. 1, HMC shall cease using Well 943 as water source effective immediately. Therefore, all water generated from the pump test of Well 943 shall be transported to and treated at the Reverse Osmosis and/or Zeolite water treatment system and shall not be directed into discharge lines for injection. Please identify which treatment system(s) will be utilized.

c. HMC shall install pressure transducer/dataloggers in all wells proposed to be monitored at least one week prior to the pumping phase to monitor water level trends. Readings shall be recorded at a minimum of one minute intervals. NMED agrees that water levels should be measured for an additional 7 days following the conclusion of the pump test on one minute intervals.

d. Water quality samples shall be collected and analyzed from Well 943 for the following constituents of concern prior to beginning of the pump test (Day 0) and at the completion of the pump test (Day 8): calcium, magnesium, sodium, potassium, bicarbonate, fluoride, phosphate, total dissolved solids, selenium, uranium^{234}, uranium^{235}, uranium^{238}, molybdenum, sulfate, chloride, thorium^{230}, radium^{226} and radium^{228}, vanadium, ammonium, total kjeldahl nitrogen, and nitrate and nitrite-nitrogen.

e. Water quality samples shall be collected at the beginning of each day of the 7-day pump test at approximately 5, 20, and 60 minutes after the beginning of the work day (8:05 am, 8:20 am, 9:00 am) and at the end of the work day (5:00 pm). Water samples shall be analyzed for the following constituents of concern: total dissolved solids, selenium, uranium^{234}, uranium^{235}, uranium^{238}, molybdenum, sulfate, chloride, and nitrate and nitrite-nitrogen.

4. *Within 30 days from the date of this letter, HMC shall submit an explanation of the potential source(s) and pathway(s) of contamination detected in Well 943.*

   NMED agrees that contaminants entering the Well 943 are most likely to enter the SAG via the well annulus from a pathway of higher concentration. However, the requirements to perform a pumping test on Well 943 and the installation of Well 943M should help in finding the true cause.

5. *Based on evaluation of data collected from the monitoring well pump test and initial sampling event, the Agencies will determine, in consultation with HMC when Well 943 will be plugged and abandoned.*

   Determination of Well 943 plugging and abandonment still pending.

If you have any questions, please contact Bill Pearson at (505) 827-0602 or by e-mail at william.pearson@state.nm.us

Sincerely,

Kurt Vollbrecht, Program Manager
Mining Environmental Compliance Section
Ground Water Quality Bureau

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